



**GOVERNMENT OF THE PUNJAB
ENVIRONMENTAL PROTECTION AGENCY**



Environmental Assessment Checklists and Guidelines

Canal Cleaning

Contents

No.	Contents	Page No.
1.	Introduction	
1.1	Background	1
1.2	Purpose of the Guidelines	
1.3	Scope of the Guidelines	
1.4	How to Use these Guidelines	
1.5	Glossary	
2.	Project Profile	2
2.1	Project Description	
3.	Environmental Impacts	3
3.1	Air Pollution	
3.2	Solid Waste Management	
3.3	Traffic Congestion	
3.4	Noise Pollution	
3.5	Water Quality	
3.6	Soil and Land Impacts	
3.7	Ecological and Biodiversity Impacts	
3.8	Social Impacts During Canal Closure	
3.9	Occupational Health and Safety	
3.10	Community Health and Safety	
3.11	Visual and Aesthetic Impacts	
4.	Environmental Mitigation Measures	4
4.1	Air Pollution	
4.2	Solid Waste Management	
4.3	Traffic Congestion	
4.4	Noise Pollution	
4.5	Water Quality	
4.6	Soil and Land Impacts	
4.7	Ecological and Biodiversity Impacts	
4.8	Social Impacts During Canal Closure	
4.9	Occupational Health and Safety	
4.10	Community Health and Safety	
4.11	Visual and Aesthetic Impacts	
5.	Environmental Checklists	8

1. Introduction

1.1 Background

Canals are an integral part of Punjab's irrigation system and play a vital role in supporting agriculture, water supply, and the socio-economic development of the province. Over time, canals accumulate silt, sediments, aquatic weeds, debris, and other obstructions that reduce their hydraulic capacity and operational efficiency. Periodic canal cleaning is therefore essential to restore water conveyance capacity, improve irrigation efficiency, reduce the risk of flooding, and ensure the reliable distribution of water to agricultural lands and other users.

Canal cleaning activities typically involve de-silting, excavation, removal of aquatic vegetation, dredging, bank repair, disposal of excavated materials, and transportation of sediments and debris. These activities are generally carried out using mechanical equipment such as excavators, bulldozers, dredgers, loaders, dump trucks, and other earth-moving machinery.

Although canal cleaning provides significant environmental and socio-economic benefits by improving water flow and reducing water losses, it may also result in temporary adverse environmental impacts if not properly planned and managed. Potential impacts include increased turbidity of water, disturbance of aquatic habitats, soil erosion, dust and noise generation, disposal of dredged material, temporary disruption of traffic and community access, and occupational health and safety risks.

1.2 Purpose of

These Environmental Assessment Guidelines have been prepared to assist project proponents, consultants, and regulatory authorities in identifying, assessing, and mitigating the potential environmental impacts associated with canal cleaning activities. The guidelines promote environmentally sound planning, implementation, and monitoring practices to ensure that canal cleaning is undertaken efficiently while protecting water resources, biodiversity, surrounding communities, and the environment.

1.3 Scope of the Guidelines

These guidelines are applicable to all canal cleaning activities within the territorial jurisdiction of the Province of Punjab.

1.4 How to Use These Guidelines

The project proponent (the local government, municipal government, city government, or the cantonment board) is obliged to use these guidelines. The project proponent must complete an environmental assessment form by following these steps:

Step 1: Provide information on the project (Use **Section I**).

Step 2: Determine Applicability (Confirm if an IEE or EIA is required under Punjab regulations) (Use **Section II**).

Step 3: Describe the physical, biological, and social environment (Use **Section III**).

Step 4: Assess potential impacts and applicable mitigation measures (Use **Section IV**).

Step 5: Provide an undertaking to the Punjab EPA regarding mitigation measures and compliance (Use **Section V**).

The completed form must be submitted to the **Punjab Environmental Protection Agency** for evaluation. The Punjab EPA may request additional information or conduct a site visit to assess the environmental impact of the proposed project.

1.5 Glossary

Act: means the Punjab Environmental Protection Act, 1997 (Amended 2017).

Aesthetic Pollution: refers to visual pollution.

Environment: means (a) air, water, and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities, and works; (f) all social and economic conditions affecting community life; and (g) the inter-relationships between any of these factors.

Impact on Environment: means any effect on land, water, air, or any other component of the environment, as well as on wildlife harvesting, and includes any effect on the social and cultural environment or on heritage resources.

Mitigation Measure: means a measure for the control, reduction, or elimination of an adverse impact of a development on the environment, including restorative measures.

Natural Drainage Pattern: means the natural system of drains.

Pollution: means the presence in the environment, or the introduction into it, of substances that have harmful or unpleasant effects.

Regulations: means the Punjab Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations 2022.

Sediments: refers to sand, silt, or clay removed from a canal during dredging.

2. Project Profile

2.1 Project Description

Canals are usually cleaned during the annual closure month, typically December. Flow is stopped at the source to make the canal dry. Regular canal cleaning provides numerous benefits by improving the overall performance and sustainability of irrigation systems. It ensures smooth and uninterrupted water flow by removing silt, weeds, and debris, thereby enhancing irrigation efficiency and reducing water losses. A reliable supply of water supports healthier crop growth and increases agricultural productivity. Canal cleaning also increases the canal's carrying capacity, reducing the risk of flooding and preventing waterlogging in agricultural fields. In addition, it improves water quality by removing waste and decaying vegetation, while

controlling aquatic weeds and reducing mosquito breeding. Regular maintenance protects canal structures from erosion and excessive silt accumulation, extending their service life and lowering long-term maintenance costs. Furthermore, it promotes fair and equitable water distribution among all users, including tail-end farmers, supports environmental protection by reducing pollution, and contributes to sustainable water resource management through efficient water conservation and utilization.

Canal cleaning involves dredging out sediments and removing invasive vegetation.

3. Environmental Impacts

3.1 Air Pollution

Canal cleaning activities generate dust due to excavation, movement of machinery, and transportation of excavated silt. Exhaust emissions from excavators, dump trucks, and other construction equipment also contribute to air pollution by releasing particulate matter (PM), carbon monoxide (CO), nitrogen oxides (NOx), and greenhouse gases. These impacts are generally temporary and localized.

3.2 Solid Waste Management

Canal cleaning produces large quantities of dredged silt, aquatic weeds, debris, plastics, and other solid waste. Improper disposal of these materials may lead to land pollution, blockage of nearby drains, and contamination of surrounding areas. Proper segregation, transportation, reuse of suitable silt, and disposal at designated sites are essential to minimize environmental impacts.

3.3 Traffic Congestion

The movement of heavy machinery, dump trucks, and construction vehicles transporting excavated material may increase traffic on nearby roads. Temporary road closures or restricted access near canal crossings can result in traffic delays, increased fuel consumption, and inconvenience to local residents and commuters.

3.4 Noise Pollution

Operation of excavators, bulldozers, trucks, pumps, and other heavy equipment generates elevated noise levels. Excessive noise may disturb nearby residents, schools, hospitals, and wildlife. These impacts are temporary and are generally confined to working hours.

3.5 Water Quality

During desilting and excavation, suspended sediments may increase turbidity in residual water within the canal. Improper handling of dredged material can introduce pollutants into nearby water bodies. If contaminated sediments are present, they may adversely affect downstream water quality unless managed properly.

3.6 Soil and Land Impacts

Temporary stockpiling of excavated material may occupy agricultural land or open spaces and can lead to soil compaction and localized erosion. Fuel or oil leaks from construction equipment may contaminate soil if preventive measures are not implemented.

3.7 Ecological and Biodiversity Impacts

Canal cleaning may temporarily disturb aquatic habitats, fish, amphibians, and other organisms living in or around the canal. Removal of aquatic vegetation can affect biodiversity, although it may also help control invasive species. Proper scheduling and environmentally sensitive cleaning methods can minimize ecological disturbance.

3.8 Social Impacts During Canal Closure

Canal closure temporarily interrupts irrigation water supplies, which may affect agricultural activities, especially if the closure coincides with crop water requirements. Farmers may experience reduced crop productivity or incur additional irrigation costs through alternative water sources. Temporary restrictions on canal crossings and increased construction activity may also inconvenience local communities. However, these short-term impacts are generally outweighed by the long-term benefits of improved canal efficiency, reliable water delivery, and reduced maintenance needs.

3.9 Occupational Health and Safety

Workers are exposed to hazards associated with excavation, heavy machinery, dust, noise, and manual handling of waste. Without appropriate safety measures, there is a risk of accidents, injuries, and heat stress. The use of personal protective equipment (PPE), safety training, and emergency response procedures is essential.

3.10 Community Health and Safety

Construction activities may increase the risk of accidents involving pedestrians and vehicles. Dust, noise, and movement of heavy equipment can temporarily affect nearby residents. Proper traffic management, fencing of work areas, warning signs, and dust suppression measures help protect public safety.

3.11 Visual and Aesthetic Impacts

Temporary stockpiles of dredged material, construction equipment, and disturbed land may reduce the visual quality of the surrounding area during canal cleaning. These impacts are temporary and disappear after completion of the work and site restoration.

4. Environmental Mitigations Measures

4.1 Air Pollution

- Sprinkle water regularly on haul roads and exposed surfaces to suppress dust.
- Cover trucks transporting excavated material with tarpaulins.

- Maintain construction machinery to minimize exhaust emissions.
- Avoid unnecessary idling of vehicles and equipment.
- Restrict vehicle speeds on unpaved roads.
- Use machinery that complies with applicable emission standards.

4.2 Solid Waste Management

- Segregate dredged silt, vegetation, and solid waste before disposal.
- Reuse suitable silt for land leveling or embankment strengthening where feasible.
- Dispose of unsuitable waste only at approved disposal sites.
- Remove floating debris and plastics regularly.
- Prevent stockpiled material from entering nearby water bodies through proper containment.
- Restore disposal sites after completion of the project.
- Haul trucks must not be overloaded and should be water-tight.

4.3 Traffic Congestion

- Prepare and implement a Traffic Management Plan.
- Schedule transportation of excavated material during off-peak traffic hours.
- Install warning signs, barricades, and traffic diversion notices.
- Coordinate with local authorities regarding temporary road closures.
- Ensure safe access for local residents and emergency vehicles.
- Deploy trained flagmen where heavy vehicle movement is frequent.

4.4 Noise Pollution

- Restrict construction activities to daytime hours.
- Regularly maintain machinery to reduce excessive noise.
- Install silencers or mufflers on equipment where practicable.
- Avoid unnecessary operation of machinery.
- Provide hearing protection to workers exposed to high noise levels.
- Inform nearby communities about the construction schedule.

4.5 Water Quality

- Minimize disturbance of sediments during desilting operations.
- Prevent excavated material from being dumped into watercourses.
- Store dredged material away from canal banks and drainage channels.
- Control fuel and oil spills through proper equipment maintenance.
- Refuel machinery only at designated locations.

- Immediately clean up accidental spills using absorbent materials.

4.6 Soil and Land Impacts

- Store excavated material on stable, designated sites.
- Avoid unnecessary disturbance of agricultural land.
- Prevent oil and fuel leakage through regular equipment inspection.
- Restore disturbed areas after completion of canal cleaning.
- Stabilize exposed soil to reduce erosion.
- Remove temporary stockpiles promptly after project completion.

4.7 Ecological and Biodiversity Impacts

- Schedule canal cleaning outside critical breeding seasons where feasible.
- Minimize removal of beneficial native vegetation.
- Relocate aquatic fauna from isolated pools where practicable.
- Avoid unnecessary disturbance to wildlife habitats.
- Rehabilitate canal banks by replanting native vegetation after cleaning.
- Prohibit hunting, fishing, or destruction of wildlife by project workers.

4.8 Social Impacts During Canal Closure

- Inform farmers and local communities well in advance of canal closure.
- Schedule canal cleaning during periods of low irrigation demand where possible.
- Minimize the duration of canal closure.
- Coordinate water distribution schedules with irrigation authorities.
- Maintain access to homes, farms, and businesses throughout construction.
- Establish a grievance redress mechanism for affected communities.

4.9 Occupational Health and Safety

- Provide workers with appropriate Personal Protective Equipment (PPE).
- Conduct regular health and safety training.
- Install warning signs around work areas.
- Ensure only trained operators use heavy machinery.
- Maintain first aid facilities and emergency response procedures on site.
- Provide drinking water, sanitation facilities, and rest areas for workers.

4.10 Community Health and Safety

- Fence or barricade active work areas.
- Install warning signs at construction sites and canal crossings.

- Control vehicle speeds near populated areas.
- Assign traffic marshals where necessary.
- Restrict unauthorized public access to construction zones.
- Develop and implement an emergency response plan for accidents.

4.11 Visual and Aesthetic Impacts

- Keep construction sites clean and organized.
- Remove excavated material as soon as practicable.
- Avoid prolonged storage of dredged material in public view.
- Restore disturbed land and canal banks after completion of work.
- Replant vegetation where appropriate to improve landscape appearance.
- Remove all temporary structures, equipment, and waste after project completion.

Environmental Assessment Checklist: Canal Cleaning

Section I: Project Description

File No:

Date:

General Information

1. Project Name or Title:
2. Project Proponent (Department, organization, or owner):
3. Address:
4. Telephone:
5. Fax:
6. E-mail:
7. Representative of the Proponent:
8. Designation:
9. Name of the person who conducted this assessment:
10. Designation:
11. Qualification:

Project Information

12. Project Location:
13. Cost of the Project:
14. Period (Proposed start and end dates):

Proposed Activity

15. Length of canal which will be cleaned:
16. Brief Project Description: *(To be filled by Punjab EPA) Please attach a map of the proposed project area*
17. Number and type of major equipment and vehicles that will be used:
18. Number and type of staff that will work on the project:
19. Is cleaning work during the night planned?
20. Where will the silt be disposed?
21. Who owns the land? ☐ Private ☐ Government
22. If it is private land, has written consent of the owner been acquired? ☐ Yes ☐ No

Section II: Screening

Is the proposed project located in an ecologically sensitive area? ☐ Yes ☐ No

If the answer to the above question is Yes, the project requires an Initial Environmental Examination (IEE) or an Environmental Impact Assessment (EIA). Refer to the Punjab Environmental Protection Agency Review of IEE and EIA Regulations, 2022 for the appropriate category.

Section III: Environmental Profile

1. Are there any sites of cultural importance (graveyard, shrine, mosque, archaeological site) within 50 m of the canal? ☐ Yes ☐ No *If yes, please describe:*
2. How many sensitive receptors (schools, colleges, hospitals, and clinics) are within 50 m of the canal? *Please describe:*
3. How many main communities and residential areas are within 50 m of the canal? *Please describe:*
4. What is the present land use of the final disposal site of the removed sediment?
5. Typical climate of the project area during the proposed work period:

Month	Temperature Range	Rainfall Range	Wind Speed Range	Wind Direction

6. Land use description for every 250 m section on both sides of the canal:

Section and Side	Setting (Urban, Suburban, Rural)	Residential (Thick, Moderate, Sparse)	Commercial (Office, Shops, Fuel Stations)	Open Land (Parks, Farmland, Barren)	Sensitive Receptors / Cultural Sites
0-250 m Right					
0-250 m Left					

Section IV: Impact Assessment

Potential Negative Environmental Impacts	Tick, if relevant	Mitigation Measures	Tick, if proposed	Monitoring
Noise	☐	Vehicles will be properly tuned and provided with functioning mufflers	☐	
Sediment/Waste Dispersion	☐	Dredged material should not be placed on roads ; directly load to trucks ; wash paved surfaces with run-off directed back to canal.	☐	
Transportation Issues	☐	Trucks should not be overloaded, must be covered, and water-tight.	☐	
Community Disruption	☐	Plan work carefully; inform community in advance; confine workers to work area.	☐	
Infectious Diseases	☐	Use gloves for organic contamination; separate and properly dispose of medical waste/syringes.	☐	
Disposal of Silt	☐	Use for leveling grounds or filling in uneven lands.	☐	

Section V: Undertaking

I, _____ for _____ as proponent for
_____ do hereby solemnly affirm and declare:

1. The information provided in Forms I, II, and III is correct to the best of my knowledge.
2. I fully understand and accept the conditions in the **Punjab EPA Canal Cleaning Guidelines (Version B)**.
3. I undertake to operate the project strictly in accordance with Form I.
4. I undertake to implement all mitigation and monitoring measures stated in Form IV.

Signature of Proponent: _____ **Date:** _____

Witnesses: 1. _____ 2. _____